



## **WATER RESOURCES RESEARCH GRANT PROPOSAL**

**Project ID:** 2005IA79B

**Title:** Improving water quality in Iowa rivers: cost-benefit analysis of adopting new conservation practices and changing agricultural land use

**Project Type:** Research

**Focus Categories:** Water Quality, Conservation, Agriculture

**Keywords:** cost-benefit analysis, micro level modeling, sediment, nitrates, phosphorus

**Start Date:** 03/01/2005

**End Date:** 02/28/2006

**Federal Funds:** \$19,683

**Non-Federal Matching Funds:** \$41,955

**Congressional District:** IA 4

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**Abstract**

Non-point source pollution due to agricultural activities is a vital issue for the State of Iowa. This project will provide a first assessment of the overall impact of a large scale conservation policy that includes several practices simultaneously on the in-stream water quality for all major Iowa rivers' outlets. This project will consider the sensitivity of the water quality improvements and costs of the policy under several alternative scenarios, thus evaluating cost-efficiency of alternative conservation plans. Sediment, nitrogen and phosphorus reductions will be estimated. The results from the proposed research project will provide critically valuable information to support effective, science-based water quality management in the state of Iowa.

Micro-unit-based economic models and data on land use and conservation practices are combined with a watershed-based hydrological model, the Soil and Water Assessment Tool (SWAT), to estimate the costs of obtaining water quality changes from the hypothetical placement of several broad-based sets of conservation practices. The practices analyzed in the assessment include terraces, grassed waterways, contouring, conservation tillage, land set-aside, and nutrient management strategies. The analysis is carried on 35 watersheds corresponding to the United States Geological Survey 8-digit Hydrologic Cataloging Units that are largely contained in the state. The watersheds correspond to 13 outlets, at which the in-stream water quality is measured. For the cost analysis we consider placing the identified set of practices all across the state. The major objective of the research is to estimate the costs of implementing alternative sets of identified conservation practices together with the reductions in sediment loadings, nitrogen, and phosphorus at the 13 outlets.